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SCIENCE AND TECHNOLOGY

The Citrus Industry

Representative of Every Interest
Representing No Special Interest

Vol. 36 — No. 9

SEPTEMBER, 1955

Insect Control

Citrus Budwood
Certification

Express Shippers
Clearwater
Convention

On The Use Of
Fertilizer On Citrus

Marketing As A Factor
Marketing Florida
Citrus

Of Citrus
Fertilization

Started On
Indication Of
Decline

\$1.00 Per Year
Continental U. S.
Per Year Outside

OW, FLORIDA

AMONG FLORIDA CITRUS LEADERS

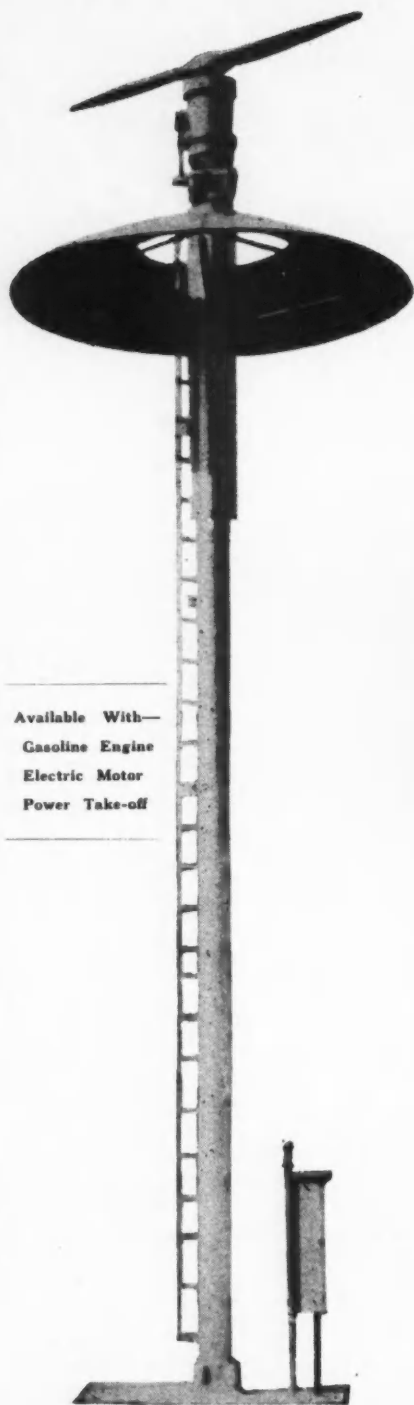


DR. A. F. CAMP

Director Florida Citrus Experiment Station, Lake Alfred. For many years Dr. Camp has been a tireless and efficient worker in the field of research for the control of citrus insects and pests, the combatting of citrus diseases and the introduction of new and improved cultural methods. The experimental work at the Station by Dr. Camp and his fellow-workers has been of inestimable value to Florida citrus growers.

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Power Take-off

Manufactured By
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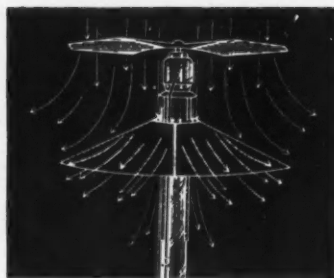
The

WEATHER MASTER

For FROST Control

- 1953 — Conceived and Designed
- 1954 — Installed and Proven In The Field
- 1955 — Repeat Orders Being Received From Satisfied Owners

HERE'S HOW IT WORKS



Employing the helicopter principle, the Weather-Master uses a specially-designed propeller to pull the warmer upper air down against an adjustable diffuser. A large opening at the top of the diffuser permits air to be driven directly down the shaft to protect the area immediately adjacent, while other air is driven against the top of the cone-shaped diffuser and spread out over a much larger area. (Patent Applied For.)

LET US DEMONSTRATE A WORKING MODEL
IN YOUR OFFICE

- Restore Those Low Areas To Profitable, Producing Grove Land
- Protect Nurseries and Young Groves
- Protect Your Valencias, Limes and Other Susceptible Fruits

BULLETIN ON REQUEST

DISTRIBUTED BY
KAIN-LAKELAND SUPPLY CO.
BOX 441
LAKELAND, FLORIDA



R. M. Pratt

Citrus Insect Control



R. B. Johnson

For September 1955

W. L. THOMPSON,
R. M. PRATT
R. B. JOHNSON*
Florida Citrus Experiment
Station, Lake Alfred



W. L. Thompson

There was a very strong red scale hatch in August, resulting in a high level of activity. In previous years when this situation has occurred, a heavy infestation has followed in October and November. At this time, only a few groves are heavily infested, but the number of light infestations is higher than usual. There will be a decline from present levels in September, followed by an increasing trend late in the month or early in October. Groves that are known to be infested, or in which red scale has been troublesome previously, should be watched so control measures can be applied before infestations increase to dangerous levels.

A purple scale hatch is in progress and the peak will be reached early in September. At the time this is written, the percent of scales in the young stages is too low for satisfactory control, but good results should be obtained the first two weeks in September. Infestations of this scale will probably average moderately high in the fall months.

Purple mite infestations were high from early March through July, but a declining trend was finally established in August. Populations will be low in September, but there may be some increase if weather is dry. Scattered heavy infestations may be expected, especially in the Ridge district.

Rust mite infestations on fruit reached a record high level the third week in August. In groves not recently sprayed, 28.3 percent of the fruit was infested. The level of activity can be expected to remain high on both fruit and leaves through September. Where sulfur has not been applied since an oil spray, populations are increasing rapidly.

SPRAY PROGRAM

It is advisable to inspect groves for scale infestations several times each year. Early fall is a period

for one of these over-all inspections. Even though the groves may have been sprayed with a scalcicide, there are some that usually need a second application. Infestations are most likely to develop in groves sprayed before July 1 and especially in those that have had no treatment since the post-bloom period. Particular attention should be paid to Florida red scale because heavy infestations can develop during September and October in groves sprayed early in the summer. The fruit of tangerines, grapefruit and early varieties of oranges should be examined for purple scale and chaff scale. It is important that fruit be free of living scales of these two species before picking, because the area around a living purple or chaff scale will not degreen in the coloring room. Green spots on fruit for the fresh fruit market are a definite grade-lowering factor.

Purple mite should also be taken into account when checking groves. Even though the average population is now at a low level, there are some groves that are likely to be heavily infested. A heavy infestation is not difficult to detect, but light infestations are frequently overlooked. If 5 to 10 percent of the leaves are infested with either active mites or eggs, the grove should be checked every two weeks and sprayed when 15 to 20 percent of the leaves are infested. It is dangerous to wait and hope a rainy period may develop and cause a reduction of mites because such natural reduction may not occur. Dry, hot winds in September and October combined with a purple mite infestation may cause a heavy leaf drop.

Scale Control: The most suitable scalcicide for this time of the year is 1.7 pounds of 15 percent parathion, or its equivalent, per 100 gallons of water. Since it is well known that parathion is not very satisfactory for purple mite control, the average grower hesitates to use it at this time of the year. If purple mite eggs are

scarce at the time of application, parathion should control the purple mite infestation for a period of four to eight weeks. If eggs are numerous, parathion should be supplemented with ovex. Oil emulsion at 0.7 percent oil plus 1 pound of 15 percent parathion is the next best choice. This combination is an effective scalcicide and miticide, but it also has certain limitations. Under adverse condition, such as dry weather, oil-parathion may cause a leaf drop; and oil is likely to affect solids adversely and retard degreening. However, 0.7 percent oil does not affect solids and retard degreening as much as 1.3 percent oil.

Before using oil of any concentration, the preceding scalcicide applications should be considered. If oil was used in the post-bloom period, a greater reduction of solids might be expected from a fall application of oil than if no previous oil application was made. A very marked decrease in solids may be expected if oil was applied in June or July and is followed by a second oil application in September or October.

Purple Mite Control: As indicated above, purple mite control may not be necessary in many groves in September. Where control is necessary, there are several miticides that can be used. Ovex at 1 to 1.5 pounds per 100 gallons is safe and fairly effective if it has not been used repeatedly in the same grove. Ovex kills mite eggs but does not kill active mites. Therefore, it is well to add ½ pound of 15 percent parathion per 100 gallons to ovex sprays if there is a heavy infestation at the time of application. Aramite at 2 pounds per 100 gallons may also be used. As stated under scale control, oil emulsion at 0.7 percent oil may also be used if solid content and degreening of fruit are not important. The secret of satisfactory purple mite control is to treat the grove before a heavy infestation develops.

Parathion can be added to the oil

(Continued on page 26)

*Written August 24, 1955. Reports of surveys by Harold Holtsberg, Cocoa; J. W. Davis, Tavares; K. G. Townsend, Tampa; E. Hallam, Avon Park; and L. M. Sutton, Lake Alfred.

3 reasons why **PARATHION** means **BIGGER PROFITS**



You market more high quality fruit

Experimental research and grower experience have proved that parathion-sprayed groves produce fruit with . . .

- higher Vitamin C content
- higher solids content
- better fruit color
- no reduction in sugar content



Your groves remain in a more vigorous condition

The healthier your groves, the more boxes of quality fruit per tree. Parathion causes . . .

- less shock to trees
- less leaf drop
- less dead wood



You economize in the spray program

Economy in the spray program can best be accomplished by using materials in combination treatments. For example, routine sulfur sprays for rust mite control can be combined with scale control when parathion is used. Because parathion is compatible with many other spray chemicals the number of applications can be reduced and production costs lowered.



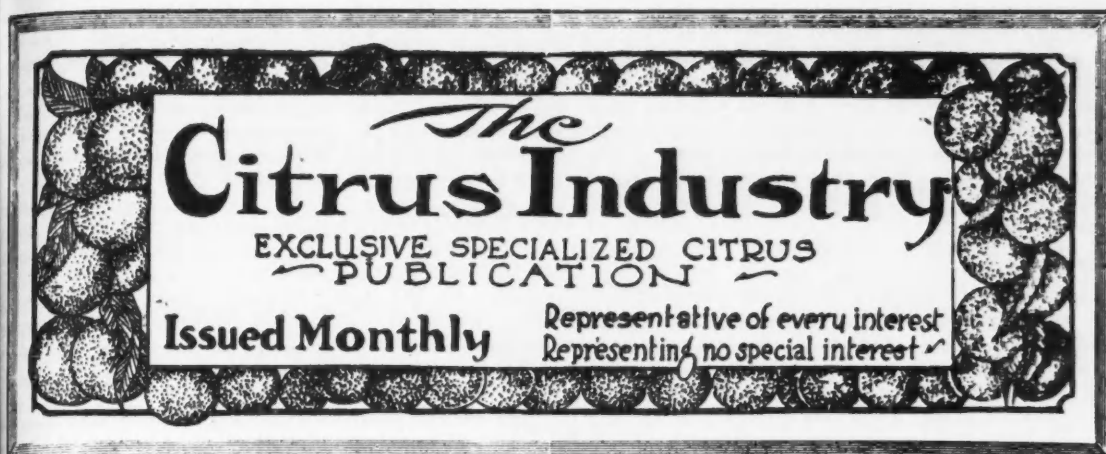
Write for New
Parathion Grower's Handbook

Consult your local agricultural authorities
for suggestions on dosages and
application procedures.

PARATHION INSECTICIDES ARE
AVAILABLE FROM NATIONAL MANUFACTURERS

AMERICAN Cyanamid COMPANY

Manufacturer of **Thiophos** Parathion Technical
Agricultural Chemicals Division
Brewster, Florida



Publication office at Bartow, Florida. Entered as second class matter February 16, 1920, at the post office at Tampa, Florida, under act of March 3, 1879. Entered as second class matter June 19, 1933, at the post office at Bartow, Florida, under act of March 3, 1879.

Advertising As A Factor In Marketing Florida Citrus

It is estimated that the past season's crop of citrus in all its forms will bring \$750,000,000 into Florida this year. This makes it second only to the tourist trade as a source of Florida's income.

Without citrus, much of what we now see as a lush green belt of groves extending across the waist of Florida would be a barren wasteland populated largely by wild cats and gophers.

You citrus people who are here today — and your fathers before you — are responsible for transforming this vast area of palmetto-covered sand and swampland into the greenest, largest and richest citrus growing area in the world.

But 20 years ago it looked like you had "come a cropper." You were doing too good a job in making citrus trees grow where nothing but palmetto and scrub pine had grown before.

Florida oranges and grapefruit were going to market faster than the market would absorb them — the more you produced the less you made. You decided to do something about expanding your markets.

You set up the Florida Citrus Commission and agreed to support it with a direct tax upon your crop.

Has this venture paid off? Let us look at the record. In the 1934-35 season, Florida produced 28 million boxes of citrus. This past season the total is estimated at 129 million boxes. The market for Florida citrus



— By —

PAUL S. PATERSON
DIRECTOR OF ADVERTISING
FLORIDA CITRUS COMMISSION

was multiplied $4\frac{1}{2}$ times in the 20 years that the Commission has been promoting citrus.

This is all the more remarkable when you realize that during this same period the consumption of deciduous fruits declined from 89 No. per capita to 69 No. — a loss of 20%! Also when you compare it with what

has happened to our major citrus competitor, California.

In the 1934-35 season California produced 58 million boxes — twice as much as Florida — but last season California came up with only 51 million boxes.

While Florida's production was going up 360%, California's was going down 12%.

As Florida's growth transpired during the 20 years which the Commission has been charged with the responsibility for promotion and development of Florida citrus, it seems evident that the Commission's activities have contributed to this remarkable record. By the Commission's activities I refer to the Research Department, under Dr. L. G. MacDowell, which was responsible for the development of frozen orange concentrate — to the Commission's regulatory functions administered by General Manager Bob Evans. By establishing and maintaining maturity standards the Commission raised the quality of our shipments of both fresh and processed fruits. Other important functions include the Commission's Merchandising Services which under the direction of Frank Arn, with a staff of 65 men, work with retailers and distributors to bring citrus products to the attention of consumers at the point of sale. Also our School Service Department under Helen Stewart, and the Commission's professional advertising to doctors and

dentists handled by our professional agency, Noyes and Sproul. Then there is our food publicity agency, Dudley, Anderson and Yutzy, who manage to get Florida citrus featured on the food pages of hundreds of newspapers and magazines every week of the year. Then there is our consumer advertising program which I will outline.

Before we get into a discussion of the advertising program proposed for the coming season, I would like to explain that the primary objective of the Commission's consumer advertising, as stated in the Citrus Code of 1949, is to increase consumer acceptance of Florida citrus and citrus products.

We do this by educating millions of families into believing that citrus is a "must" item in their daily diet.

This is a little different conception regarding the purpose of our advertising than that held by some people in the industry.

Some people feel that the purpose of our advertising should be to get a better price for their fruit, year after year. This yearly price increase is expected regardless of violent and erratic fluctuations in production of both Florida citrus and the fruits and juices with which it competes — despite rising and falling economic conditions — and regardless of differences in the overall quality and size of the fruit from year to year.

Advertising has worked miracles — but it has never yet been able to abrogate the law of supply and demand — and citrus prices are determined by the law of supply and demand — the same law that sets the price for every other commodity. Advertising can only influence one of these factors — demand.

Even advertisers with established brand names on which they can control supply, do not expect their advertising to raise prices.

Campbell's soup is a good example. Back in 1935, when the Commission started, the retail price of a can of Campbell's tomato soup was 10c. Today, you can walk into a Publix market or a Kwik-Chek store and buy a can of Campbell's tomato soup — and the price is still 10c.

"Then," you may ask, "why in the world is Campbell's now spending \$10,000,000 a year on advertising?"

Their answer would be the same as ours, "We are maintaining and expanding the market for our products. Our profits come from increased sales."

When we expand the market for citrus, we expand the entire economy of the State of Florida. More rough

land, worth \$150 per acre, is turned into groves worth \$1,500 per acre — bought and sold for use on existing groves — more labor is employed in packing plants and canneries — more dollars come into the state to pay the butcher, the baker and the candlestick maker. Every resident of Florida profits.

Now let us take a look at the program for the 1955-56 season which our new advertising agency, Benton & Bowles, presented to the Florida Citrus Commission on July 20.

It is a program designed to do two things: First, to suggest the immediate purchase of Florida citrus fruit in one of its most common forms — fresh, frozen or canned. Second, to increase the acceptance of the idea that the daily use of citrus in one form or another is essential to the well being of every family in the U. S. and Canada.

Here is how we will divide our \$3,000,000 between advertising media:

Advertising Expenditures By Media
Florida Citrus Commission
1955-56

BROADCAST — \$1,520,000 — 50.7%
Television — \$1,380,000
Radio — \$140,000

NEWSPAPERS — \$855,000 — 28.5%
Black and White Newspaper U. S. \$300,000
Black and White Newspapers Canada \$125,000 — 425,000
Newspaper Color Supplements \$430,000
Magazines (LIFE and POST) \$325,000 — 10.8%

PRODUCTION — \$150,000 — 5.0%
TRADE PAPERS — \$50,000 — 1.7%
RESERVE — \$100,000 — 3.3%
TOTAL — \$3,000,000 — 100.0%

You will note that television gets the major share. This is because our products lend themselves so well to the demonstration possibilities of television. Television also offers the advantage of making sight and sound impressions.

Then there is our own experience with television in the past season, when using TV as our primary media, we reversed an eight year trend and sold more grapefruit in all forms than Florida had ever sold during a similar 12 month period.

Only \$140,000 is assigned to radio, but with this we get national spot coverage — 7½ spots per week on 561 Mutual stations during the 26 week period where we have both fresh and processed citrus to sell.

Newspapers will be the second major media with a total of \$855,000, or 28.5% of the total. Part of this will be used for full color ads in Sunday newspaper supplements.

Color, we feel, is very important in selling citrus because it not only gets more attention and more readership than black and white ads get, but it also gives us the advantage of appetite appeal which is a powerful buying influence with a food item as colorful as citrus.

Our magazine ads will appear in LIFE and SATURDAY EVENING POST, the two full size general magazines having the largest circulation.

Production costs are estimated at \$150,000. This includes art work for magazine and newspaper ads and the preparation of film commercials for television.

There is an item of \$50,000 for ads in grocery trade papers to give retailers advance notice of our promotions, and an item of \$100,000 set aside for special promotions to meet emergency situations which may develop.

On television we will use film commercials such as the one outlined here on what we call a "story board" — which is a rough blueprint to show the action in correlation with the commercial copy.

Just listen to this record which has a catchy jingle to be used in connection with an animated cartoon as shown on this "story board."

To promote grapefruit we plan on using some films presenting Miss America of 1956, after she is chosen at Atlantic City this September. She will endorse Florida grapefruit, the unforbidden fruit as an aid to keeping a good figure.

Here are some rough blow-ups of newspaper and magazine ads. I think you will see that we have some ideas here that really sparkle — ideas that will stop readers — make them think — and induce many of them to buy more Florida citrus.

This headline, "There's a Reason for Squeez'n," is designed to get attention and sell the advantage of fresh Florida oranges over from "you know where."

In our grapefruit ads we believe we have a "conversation piece." By referring to grapefruit as the "Unforbidden Fruit," we hope to share in the publicity which has been accorded the "Forbidden Fruit" since the day Adam and Eve got tossed out of the Garden of Eden.

You will note, too, that our orange ads retain the "hand and glass symbol" which has now become a trademark for Florida oranges and orange juice.

Also notice that we are introducing a new device in the signature of all our ads showing an outline map of the State of Florida with a sunburst

(Continued on Page 8)

Express Shippers Holding Clearwater Convention

Florida's "express" or "gift box" shippers sent over 3,000,000 packages of citrus fruits out-of-state during the 1954-55 season.

The exact figures are still being compiled by Florida Express Fruit Shippers Association. Through April, the total was 2,844,364. (They were not final as this article was completed, Aug. 15).

It is estimated that Florida's express shippers paid the express company around \$6,500,000 during the season. Through April, the exact total paid in express was \$6,335,000.

The Association is holding its annual convention, the ninth, in Clearwater, Sept. 20, 21, 22, at the Fort Harrison Hotel. Mr. Wm. A. Stubbs, secretary-manager, expects that 500 or more persons will attend.

"The Florida Express Fruit Shippers Association is composed of some 240 'gift' shippers, and 75 honorary member-suppliers," Mr. Stubbs, explained, adding: "the major function of the Association has been in transportation. With the combined efforts of the Florida Citrus Commission, and the Growers and Shippers League of Florida, the express shippers still enjoy the lowest rates in the Express Agency's tariffs.

"The Association is also active in advertising and legislative matters.

"The Florida Citrus Commission has worked closely with the Association to promote express fruit business through the use of 55 billboards scattered along Florida's highways last season, plus the printing of millions of folders concerning citrus varieties and receipts involving the uses of citrus fruits."

"This year, the citrus commission is adding to the past program by preparing an attractive folder on the Florida temple orange. Approximately 750,000 of these brochures will be mailed to customers of the Florida fresh fruit shipping industry. The value of such a mailing is very great and should result in additional sales of commercial shipments of temples, as well as for the express shippers.

"The members of FEFSA have led the fight to improve standards in gift shipping. All members guarantee customers satisfaction with their packages, and many shippers actually enclose in the pack 'reply' cards requesting information on the condition



— By —
HERB MOSHER

of the fruit upon arrival. Such close contacts with the customers in the north has led to many improvements in wrapping, pack, in containers used, etc.

"The 55-pound bushel 'basket' container has proved the most popular with the express shipping trade; the ½-bushel is a close second.

"The express fruit shipping business is highly seasonable, with approximately 38% of the traffic moving in December. A big need for the industry is in fruits that mature in the summer to accommodate the now very heavy influx of tourists during these summer months.

"With the increase in the popularity of the mango, this fruit may become a good source of supply for gift shipping during our summers. To acquaint shippers throughout the state with the possibilities of the mango, the Association will conduct a forum dealing with mango shipping at the September convention.

"Dr. R. Bruce Ledine, of the Sub-Tropical Experiment Station, Homestead, will address the convention on this subject, discussing some of the new and improved mango varieties now available for shipping.

"The lime has been shipped by members of the express group, but in small volume. Increased advertising and merchandising by the newly organized Florida Lime Commission should help popularize this fine Florida fruit, — to the extent that a larger volume of limes will be handled by the express shippers."

Turning again to the subject of transportation, it develops that the Association has tried to work out

alternate methods of transporting packages of citrus by ways other than by railway express. Heretofore the express agency has enjoyed almost a complete monopoly. However, association tests have shown that fruit shipments can be trucked successfully to destination cities where local "parcel companies" can deliver directly to consignees at rates below those presently charged by the express agency.

The great majority of members of FEFSA are actual growers of citrus, owning their groves and packing plants.

President Earnest Thompson, Maitland, of the association has stated that "groves which supply these gift packages require additional spraying and the use of more organic fertilizers to provide the high quality fruit necessary for successful 'gift' fruit operations." The philosophy of the president is that "the gift shipper must constantly find ways to improve his fruit as well as his grade and pack."

The tremendous increase in 'gift' package shipments, directly to the continual striving of the 'gift' shipper to give his customers the highest quality fruit available, in the most attractive packages.

The September convention of FEFSA really will be a big and important affair. Here are a few of the highlights according to the official program:

Robt. Rutledge, general manager, Florida Citrus Mutual, will address the members, the subject of his speech being, "What's Ahead for Citrus."

Dr. R. Bruce Ledine, from Homestead's Sub-Tropical Experiment Station, will talk on "Mango Varieties and Their Shipping Qualities." He will also present a series of slides on varieties to show the eye appeal of new mangoes which could be of real importance to the gift shipping business.

The Association will also present several 'wholesale' packers of mangoes who will discuss how to display and take orders for this tropical fruit. These discussions are designed to show the express people from all over the state how they can ship mangoes profitably. Included among these 'commercial' mango men are,

14%

Your crop will show any skimping in this *Vital Fraction*



About 14% of the total per acre average crop cost for tomatoes is in fertilizer. Skimp on this and you're endangering the value of the other factors that amount to 86% of your per acre crop cost. Pennies saved may mean dollars lost.

Insure the excellence and quality of your crop yields by using IDEAL FERTILIZERS with ORGANIC NITROGEN from high-grade natural sources such as GENUINE PERUVIAN GUANO which is now available in IDEAL BRANDS.

Genuine Peruvian Guano is a bird guano collected from the habitat of fish-eating birds, mostly cormorants and boobies, on the coast of Peru. It is a rich source of natural organic nitrogen, phosphoric acid and potash. Also contains a wide variety of essential trace elements. Crop response to Peruvian Guano as a fertilizer is quick, as well as long lasting. Available again in Ideal Brands.



**WILSON & TOOMER
FERTILIZER COMPANY**

Plants in Jacksonville, Tampa, Cottendale, Port Everglades
GENERAL OFFICES • JACKSONVILLE, FLORIDA

Paul Gramling and Leonard Battle, both of Miami.

Dr. Frank Goodwin of the University of Florida's College of Business Administration will discuss "Proper Selling Techniques" to be used in the 'gift' package business.

Orville Reed, recent winner of the Direct Mail Advertising Association's "Best of Industry" award for excellence in business writing, will discuss "Letter Writing Techniques for Members to Use in Direct Mail Literature."

Vice President Kenneth Merritt, of the Railway Express Agency, New York, will meet with convention delegates to talk over transportation problems which arise in the handling of express packages, and how service can be improved in the future.

Approximately 52 booths will be showing the express shipper everything that will be available for his business next season. Displays will include machinery, jellies, candies, gift items, new containers, and similar. These will all be at the Fort Harrison Hotel, headquarters of the convention.

President Earnest Thompson in August, personally suggested to this writer that he would like to extend an invitation to all persons interested in the gift fruit industry to attend."

Full data about the convention can be had by contacting Mr. Stubbs at FEFSA headquarters, 1223 1/2 No. Orange Ave., in Orlando. His phone number is 26253.

Any organization whose members ship in excess of 3,000,000 boxes of citrus in a season is indeed important. And the future holds much promise.

ADVERTISING AS A FACTOR IN MARKETING FLORIDA CITRUS

(Continued From Page 6)

Efforts are being made to have this symbol imprinted on our fruit and our canned citrus as a means of identifying our products with our advertising.

It has only been possible to touch on some of the high spots of our 1955-56 program. When Benton & Bowles presented it to the Commission it required 3 1/2 hours and the Commission, as well as representatives of the industry, showed very keen interest in every phase of it. It was unanimously accepted and acclaimed.

I hope you will agree with them that it is an attention-getting, hard-hitting advertising campaign.

There are over 300,000 kinds of plants growing in the world. So far, man has found use for only 2 percent of them.

Citrus Packing House Procedure At Fla. Southern

"The Community College Program at Florida Southern College, Lakeland, is again presenting an evening course in Citrus Packinghouse Procedures.

By a special arrangement with the University of Florida, this course is being taught by Dr. W. Grierson of the Citrus Experiment Station, Lake Alfred.

The course will cover all phases of fresh fruit handling from harvesting until it reaches the retail store.



DR. W. GRIERSON
CITRUS EXPERIMENT STATION,
LAKE ALFRED

Traditional Florida citrus packing-house methods are presented together with the latest developments in packinghouse methods in Florida and elsewhere. Of particular interest is the presentation of new methods such as bulk handling of fresh citrus (a procedure developed by the Lake Alfred Station and at present being adopted by several progressive packing-houses).

The course will consist of a three hour lecture, one evening a week October through January, and will be held in the new Polk County Science Building at F.S.C. Details of schedule and registration can be obtained from the Registrar at Florida Southern."

It pays to Spray and Dust with **FASCO** PESTICIDES

When harvest time rolls around, quality must join hands with quantity to show a profit.

Adequate protection against plant pests is a basic element in assuring both quality and quantity. Be sure to pick pesticides that positively protect. FASCO pesticides are:

- Quick acting
- Powerful
- Long lasting
- Economical

Manufactured by
FLORIDA AGRICULTURAL SUPPLY COMPANY



DIVISION OF WILSON & TOOMER FERTILIZER CO
JACKSONVILLE, FLORIDA

Soil insects often undo an otherwise "perfect" farming program. Insure against wireworms, mole crickets and the like. Treat the soil with FASCO Soil Insecticides at planting time.





R. B. Johnson

Malathion, earlier referred to as Experimental Insecticide 4049 and malathion, was first tested as a scalecide by the junior author in 1950. This material has now been tested against citrus pests for about four years. What has been learned about the control of purple scale, *Lepidosaphes backii* (Newm.), Florida red scale, *Chrysomphalus aenidum* (L.), chaff scale, *Parlatoria pergandii* Comst., soft brown scale, *Coccus hesperidum* L., citrus red mite, *Metatetranychus citri* (MacG.), and rust mite, *Phyllocoptruta oleivora* (Ashm.) with malathion is summarized in this paper.

Malathion is the common name for O,O-dimethyl dithiophosphate of diethyl mercaptosuccinate. Thus, like parathion, it is an organic phosphate compound, but is reported to have a relatively low mammalian toxicity. According to Lehman (1) comparative figures on the toxicity to rates of many common insecticides show that malathion is less poisonous than nicotine, lead arsenate, chlordane, and DDT. Figures recently released by the manufacturer show that between 1520 and 2866 milligrams of 95 percent pure malathion per kilogram of body weight is needed in a single oral dose to kill a male albino rat. When these figures are compared with the low rate of only 3 milligrams of technical parathion needed to kill the rat, it is easily seen that malathion must be a relatively safe material to handle and use. The necessary precautions for its safe use are believed to be similar to those for DDT.

Formulations supplied by the manufacturer and tested prior to April of 1953 were a 25 percent wettable powder and a 57 percent emulsifiable liquid made from less than 95 percent pure technical malathion. Formulations supplied after April of 1953 contained the same percentage of technical malathion as before, but were made from 95 percent pure technical malathion. The diluent was also changed in the 25 percent wettable powder.

(1) Presented before the Florida State Horticultural Society on October 20, 1954. This investigation was aided by a grant from American Cyanamid Company.

Studies On The Use Of Malathion On Citrus¹

— By —

ROGER B. JOHNSON AND
W. L. THOMPSON
FLORIDA CITRUS EXPERIMENT
STATION, LAKE ALFRED



W. L. Thompson

as pounds of actual toxicant per 100 gallons of spray unless otherwise specified. Wettable sulfur at 5 to 10 pounds per 100 gallons was included in all malathion and parathion sprays for control of rust mites.

Tabular figures under "Corrected Relative Infestations after Sprays" were calculated from counts of scale insects made before and after treatment using a formula developed by Ebeling (2). These figures do not show the sizes of the scale insect infestations, but show the relative sizes of the populations corrected for dif-

Although some information obtained from tests with the older formulations is included in this paper, emphasis is placed on the newer formulations since these are the ones now being sold.

Although the above described formulations were used amounts of malathion and parathion will be expressed

Table 1.
Control of Low (1) Infestations of Purple Scale with Various Amounts of 25 Percent Malathion Wettable Powder.

Materials in Pounds per 100 Gallons Malathion and Parathion Expressed as Active Ingredients - Sprays Applied April 21, 1953.				Percent Decrease in Live Purple Scale After Sprays	Corrected Relative Infestations After Sprays
Malathion	.75, wettable	sulfur	10	78	271
Malathion	1.00, wettable	sulfur	10	79	255
Malathion	1.25, wettable	sulfur	10	95	63
Malathion	1.50, wettable	sulfur	10	91	109
Parathion	.25, wettable	sulfur	10	92	100(1)
Wettable sulfur	10			+229	4062

(1) 8.5 live purple scale of all stages per leaf before parathion treatment, 0.7 after treatment.

Table 2.
Control of Low (1) Infestations of Purple Scale with Various Amounts of 57 Percent Malathion Emulsifiable Liquid

Materials in Pounds per 100 Gallons Malathion and Parathion Expressed as Active Ingredients - Sprays Applied April 1, 1953.				Percent Decrease in Live Purple Scale After Sprays	Corrected Relative Infestations After Sprays
Malathion	.62, wettable	sulfur	10	84	323
Malathion	.94, wettable	sulfur	10	94	96
Malathion	1.22, wettable	sulfur	10	96	70
Malathion	1.56, wettable	sulfur	10	96	65
Parathion	.25, wettable	sulfur	10	94	100(1)
Wettable sulfur	10			+54	2605

(1) 4.1 live purple scale of all stages per leaf before parathion treatment, 0.2 after treatment.

ferences that existed before treatment. Parathion is used as the standard at 100 and all other treatments are compared with it.

Purple Scale

Control of low infestations of purple scale with various amounts of 25 per-

cent purple scale. In 1952 three sets of heavily infested trees were sprayed with .75 pound of malathion. One set was sprayed in late July, the second set in August, and the third in early October. The July spray gave no reduction of purple scale, but a decrease

shown in Table 3. Two applications of low amounts of both malathion wettable powder and emulsifiable liquid as well as parathion were used. In the first application .75 pound of malathion gave a reduction in purple scale equal to that obtained with .15 pound of parathion. The second application, applied in July, was not as effective as the first, applied in April. Parathion gave an excellent reduction in both sprays. As a result, corrected relative purple scale populations were about 11 times higher after two applications of .75 pound of malathion than after two sprays of .15 pound of parathion.

Florida Red Scale

Less work has been done with malathion against Florida red scale than against purple scale, but in all tests where both insects have been present, malathion has always given better results against Florida red scale than against purple scale. The same has also been true with parathion. These data are shown in Table 4.

Chaff Scale

Malathion has been tested against chaff in only two tests and results have not been encouraging. Dosages of .38, .62, and .75 pound of malathion per 100 gallons of spray applied in April resulted in corrected relative

Materials in Pounds per 100 Gallons
Malathion and Parathion Expressed as
Active Ingredients - Sprays Applied
April 22 and July 20, 1954.

			Percent Decrease in Live Purple Scale After One Spray	After Two Sprays	Corrected Relative Infestations After Sprays
Malathion e.l.	.38, wettable sulfur	5	43	84	1232
Malathion e.l.	.62, wettable sulfur	5	56	93	582
Malathion w.p.	.75, wettable sulfur	5	75	85	1153
Malathion w.p.	1.00, wettable sulfur	5			
	(first spray)		87		
Malathion w.p.	.50, wettable sulfur	5			
	(second spray)			87	1021
Parathion w.p.	.15, wettable sulfur	5	76	99	100(1)
Wettable sulfur 5			29	31	5450

(1) 4.58 adult female scales per leaf before parathion treatment, 0.58 after two sprays.

cent malathion wettable powder is shown in Table 1. Here a dosage of 1.25 pounds of malathion was about equal to .25 pound of parathion. The higher dosage of 1.50 pounds of malathion was no better, but lower amounts of .75 and 1.00 pound, although poorer than parathion, were not significantly poorer. The practical significance of these figures is demonstrated by comparison of corrected relative infestations for all scalecide sprays with the same figure for the sulfur spray. Although the corrected relative infestation of 271 for .75 pound of malathion is greater than the 63 for 1.25 pounds of malathion, for practical purposes there is little difference when both are compared with the 4062 where only sulfur was used. Similar results with various amounts of 57 percent malathion emulsifiable liquid are shown in Table 2. Although dosages of .94, 1.22, and 1.56 pounds of malathion were equal or superior to .25 pound of parathion, the dosage of .62 was not as good. There were no significant differences between any of the scalecide sprays, but all were significantly better than the sulfur spray. These data, therefore, show that .75 pound of malathion per 100 gallons of spray will give adequate control of low populations of purple scale and that probably little is to be gained with larger amounts.

Malathion has not given consistent results against heavy populations of

of 62 percent in leaves infested with purple scale was obtained in August and 84 percent in early October. Similarly inconsistent results were obtained against high purple scale populations in 1954. These data are

Table 4.
Comparative Percentages of Reduction in Purple Scale and Florida Red Scale with Malathion and Parathion

Malathion 25 Percent Wettable Powder, 3.0 Pounds per 100 Gallons		Parathion 15 Percent Wettable Powder, 1.0 Pounds per 100 Gallons	
Purple Scale	Red Scale	Purple Scale	Red Scale
-79	-93	-81	-91
-68	-92	-24	-38
-62	-71	-78	-84
-84	-95	-94	-97
-75	-99	-76	-99

Table 5.
Comparative Efficiency of Oil Emulsion, Malathion and Parathion Against Purple Mite

Materials per 100 Gallons Malathion and Parathion Expressed as Pounds of Active Ingredients	Percentage of Infested Leaves	
	Before Sprays	After Sprays Average
(Sprayed July 28)	(July 25)	(October 3) (1)
Oil Emulsion 1.3 percent	51.8	5.6
Malathion .75, wettable sulfur 5	45.6	30.3
Parathion .15, wettable sulfur 5	49.5	40.1
(Sprayed August 28)	(August 26)	(November 13) (2)
Oil Emulsion 1.3 percent	25.6	2.3
Malathion .75, wettable sulfur 5	36.7	14.0
Parathion .15, wettable sulfur 5	25.7	15.0
(Sprayed October 3)	(September 29)	(December 11) (3)
Oil Emulsion 1.3 percent	14.6	5.8
Malathion .75, wettable sulfur 5	15.1	15.2
Parathion .15, wettable sulfur 5	10.5	11.8

(1) Average of purple mite counts of 8/7, 8/20, 9/10, and 10/3.

(2) Average of purple mite counts of 9/2, 9/16, 9/29, 10/14, 10/28, and 11/13.

(3) Average of purple mite counts of 10/14, 10/28, 11/13, and 12/11.

Rates Of Citrus Fertilization

Each citrus grove is different in many ways from other groves. Our concern here is chiefly efficiency of groves in the use of fertilizer elements in the production of fruit. Statements made will deal largely with averages. This means there will be exceptions found in some groves to most, if not all, statements made. Our concern here is to see what the trends are for a group of groves. These trends or averages might serve only as beginning points to arrive at optimum fertilization rates for individual groves. Variations in efficiency of groves indicate that averages presented apply to a minimum number of individual groves. The overall object is to improve the efficiency of each individual grove as much as is practical.

There are many things that enter into this variation in grove efficiency. Efficiency is used here to mean the relationship of the quantity of fruit produced to the amount of fertilizer added. For maximum efficiency there must be a maximum number of boxes of fruit produced with the minimum amount of fertilizer added per box of fruit.

Some of the things entering into or causing variation in fertilizer efficiency are:

- Age of trees
- Inherent qualities of the trees
- Rootstock
- Variety
- Tree spacing
- Soil
- Fertilizer added — whether balanced and of sufficient quantity
- Insect and disease control
- General grove management
- Rainfall
- Irrigation

These variations result in a wide spread in the amount of fertilizer elements needed for optimum fruit production. The amounts actually added to the groves make up much wider variations than that thought of as being "needed." Our concern here is with what was added in the form of fertilizers plus nutritional sprays. The same amount of fertilizer applied per acre on two comparable groves would not necessarily result in the same amount of fruit produced. Also, the same amount of fertilizer added to the same acreage in successive seasons would not necessarily result in the same amount of fruit produced. The data presented are averages over several seasons on



— By —

ZACH SAVAGE
AGRICULTURE ECONOMIST
AGRICULTURAL EXPERIMENT
STATION

groves of cost account studies of the Florida Agricultural Experiment Stations and Extension Service, Gainesville.

Nitrogen added. Records for the 13 seasons of 1940-53 indicate that in some cases more nitrogen was added to bearing groves of mixed citrus than may have been economically feasible. At the same time, it must be remembered that more nitrogen is required per box of fruit produced on some groves than is required by other groves. Less than 200 pounds of nitrogen per acre was added on 82 per-

cent of these groves. The group with the highest yield and highest net returns per acre was where 250 to 299 pounds of nitrogen was added annually per acre or 0.59 pound per box. Florida Bulletin 536 suggests the use of 0.4 pound of nitrogen per box of fruit anticipated. There were 55 percent of these groves for 13 seasons on which 0.4 pound or less was added. The average added on all groves for the period was 0.48 pound. See Table 1.

It would be wise for each individual grower to arrive at an optimum figure for each individual grove. This may be done by beginning with the average added to the grove for the past several seasons or using 0.4 pound as suggested in Bulletin 536 and varying amounts applied until an optimum figure is obtained for each individual grove. Optimum figures should be arrived at through the considerations of both per-acre and per-box data. Suggestions for other elements are included in this same bulletin.

Elements added on orange groves. Data on fertilizer elements added on orange groves are shown in Table 2. The average yield on all orange groves for 11 seasons, 1942-53, was 338 boxes at 24 years of age. Twenty-five percent of these same groves that received the lowest amount of nitrogen per box of fruit had an average yield 20 percent higher or 404 boxes. At the same time the 25 percent that were highest in nitrogen applied per box had an average yield of 207 or 39 percent less than the average for all groves.

The 25 percent group that used the nitrogen applied most efficiency produced three boxes of fruit for each pound applied. This same group was more efficient in the use of the other elements applied. Conversely, the 25

TABLE 1.
NITROGEN ADDED AND OTHER DATA ON ALL GROVES, 1940-53
Trees 31 percent grapefruit at 27 years of age.

POUNDS N ADDED	NUMBER RECORDS	N ADDED IN POUNDS	YIELD	FERTILIZER COST		OPERATING COST		RETURNS		NET	
				ACRE	BOX	ACRE	BOX	ACRE	BOX		ACRE
Under 100	621	88	.35	253	\$36.76	\$.15	\$116.55	\$.46	\$321.31	1.27	\$204.76
100 - 149	914	127	.41	312	48.19	.15	138.04	.44	396.24	1.27	258.20
150 - 199	754	180	.48	378	57.58	.15	156.05	.41	480.06	1.27	324.01
200 - 249	319	249	.60	415	68.21	.16	155.14	.37	527.05	1.27	371.91
250 - 299	119	266	.59	452	72.34	.16	162.87	.36	574.04	1.27	411.17
300 - 349	43	300	.69	432	76.12	.18	180.52	.42	548.64	1.27	368.12
350 - 399	20	350	1.20	292	86.82	.30	186.57	.64	370.84	1.27	184.27
400 & over	16	450	1.12	400	98.10	.25	192.52	.48	508.00	1.27	315.48
Total or Average	2806	162	.48	340	\$53.20	\$.16	\$144.43	\$.42	\$431.80	1.27	\$287.37

percent group that was the least efficient in nitrogen use was also the least efficient in the use of the other elements applied. The yield of the most efficient group was almost double the yield of the least efficient

yield of the most efficient was 46 percent higher than the latest efficient group, and the net returns per acre 165 percent higher.

Over the 10 seasons of 1943-53 the average yield decreased. See Table

that the application per box increased. These were nitrogen and magnesium. Elements applied in increased quantities per acre and per box were zinc, iron and calcium.

Summary statement. The examples cited indicates that operators of the least efficient groups of groves would find it too rough to remain in the business without increased efficiency with increased competition from whatever cause. Not all groves could be brought into the most efficient group, but where possible efficiency should be increased in all groups. Increased efficiency might be attained on some groves by decreasing some or all fertilizer elements applied. Whereas, efficiency might be realized on other groves by increasing certain or all elements added. Improvement might be made in other phases of production, such as insect and disease control, hedging, cultural practices, elimination of low producing trees from all causes, and in overall general management of the grove.

Saddles in Honduras have no saddle horns, so the cowboys there take one end of the lasso and braid it to the horse's tail. According to Archie Barr in the University of Florida Press book, "High Jungles and Low," the horse seems to feel no pain at all when a steer is roped.

TABLE 2.
FERTILIZER ELEMENTS ADDED ON ORANGE GROVES, 1942-53
Average age of trees 24 years

	25% Of Groves Lowest in N Added Per Box		All Groves		25% Of Groves Highest in N Added Per Box	
	ACREAGE INVOLVED BOXES PER ACRE					
NUMBER OF RECORDS	197		768		197	
ACREAGE INVOLVED	6504		20571		4143	
BOXES PER ACRE	404		338		207	
Fertilizer Material Cost	\$47.33	\$.12	\$56.31	\$.17	\$54.45	\$.26
Operating Cost	165.00	.41	174.97	.52	161.04	.78
Returns from Fruit	622.16	1.54	520.52	1.54	318.78	1.54
Net Returns	457.16	1.13	345.55	1.02	157.74	.76
Fertilizer Elements Added						
N	128	.32	168	.47	168	.81
P ₂ O ₅	109	.27	117	.35	103	.50
K ₂ O	177	.44	194	.57	187	.90
MgO	130	.32	134	.40	112	.54
MnO	19.33	.048	20.03	.065	20.21	.098
CuO	13.55	.034	15.30	.045	13.80	.067
ZnO	5.01	.012	5.20	.015	3.48	.017
Fe ₂ O ₃	10.03	.007	7.50	.022	2.96	.014
B ₂ O ₃	1.41	.004	1.57	.005	1.19	.006
CaO	180	.45	150	.44	113	.55

group, and the net returns were almost three times as much.

Over the 10 seasons of 1943-53 there were some shifts as to amounts of elements applied on orange groves. This is indicated by the averages for the two 5-year periods of 1943-48 and 1948-53 in Table 3. The average yield changed very little but increased slightly. The price of oranges decreased 14 cents per box which decreased returns and net returns per acre. Amounts applied per acre and per box decreased for nitrogen, phosphate, potash, magnesium, manganese, and copper. Of these six elements where there were decreases in the per-acre applications, there were two

3. The average for the second 5-year period was 14 percent less than the first. The price of fruit decreased from \$1.03 per box to 94 cents, resulting in a decrease in net returns per acre of 37 percent. Elements applied per acre decreased for nitrogen, phosphate, potash, magnesium, manganese, and copper. Of these six elements where there were decreases in the per-acre applications, there were two

TABLE 3.
FERTILIZER MATERIALS APPLIED AND OTHER DATA ON TREES 30 YEARS OF AGE

	ORANGES				GRAPEFRUIT			
	1943-48 Acre	Box	1948-53 Acre	Box	1943-48 Acre	Box	1948-53 Acre	Box
Boxes Per Acre	375		383		483		415	
Fertilizer Materials Cost	\$ 63.75	\$.17	\$ 61.28	\$.16	\$ 86.94	\$.18	\$ 70.55	\$.17
Operating Cost	191.25	.51	202.99	.53	207.69	.43	207.50	.50
Fruit Returns	596.25	1.59	555.35	1.45	497.49	1.03	390.10	.94
Net Returns	405.00	1.08	352.36	.92	289.80	.60	182.60	.44
Fertilizer Elements Added								
N	188	.50	169	.44	227	.47	212	.51
P ₂ O ₅	146	.39	115	.30	213	.44	133	.32
K ₂ O	240	.64	199	.52	324	.67	224	.54
MgO	139	.37	161	.42	198	.41	174	.42
MnO	29	.077	21	.054	43	.088	23	.056
CuO	23	.061	12	.031	36	.075	17	.042
ZnO	3	.008	9	.023	5	.010	9	.021
Fe ₂ O ₃	2	.004	15	.039			5	.012
B ₂ O ₃	1	.002	2	.006	2	.003	2	.006
CaO	109	.29	222	.58	145	.30	232	.56

TABLE 4.
FERTILIZER ELEMENTS ADDED ON GRAPEFRUIT GROVES, 1942-53
Average age of trees 26 years

	25% Of Groves Lowest in N Added Per Box		All Groves		25% Of Groves Highest in N Added Per Box	
	ACREAGE INVOLVED BOXES PER ACRE					
NUMBER OF RECORDS	28		99		28	
ACREAGE INVOLVED	418		1329		359	
BOXES PER ACRE	494		398		338	
Fertilizer Material Cost	\$63.42	\$.13	\$69.60	\$.17	\$87.12	\$.26
Operating Cost	153.02	.31	180.33	.45	206.35	.61
Returns From Fruit	484.12	.98	390.04	.98	331.24	.98
Net Returns	331.10	.67	209.71	.53	124.89	.37
Fertilizer Elements Added						
N	164	.33	192	.48	256	.77
P ₂ O ₅	131	.26	152	.38	190	.56
K ₂ O	220	.44	241	.61	290	.86
MgO	166	.34	160	.40	187	.55
MnO	23.76	.050	27.82	.070	32.03	.095
CuO	23.31	.048	22.82	.058	25.94	.077
ZnO	5.33	.010	5.82	.015	4.18	.012
Fe ₂ O ₃			3.17	.007		
B ₂ O ₃	1.38	.002	1.63	.003	.50	.002
CaO	177	.42	166	.42	195	.63

Elements added on grapefruit groves. Data from a small number of grapefruit groves are presented in Table 4. The average age of all grapefruit groves was 26 years, or two years older than the orange groves. The average yield of grapefruit at 338 boxes per acre was 60 boxes or 18 percent higher than for orange groves. Yields shown are commercial production. In some seasons on some groves not all fruit produced was picked. The 25 percent of groves that received the lowest amount of nitrogen per box of fruit had an average yield of 494 boxes or 24 percent above average. The 25 percent that were highest in nitrogen applied per box had an average yield of 338 boxes or 15 percent below average.

The 25 percent of grapefruit groves that used nitrogen applied most efficiently produced three boxes of grapefruit for each pound applied. This same group was more efficient in the use of the other elements applied with the exception of boron. The

Citrus Budwood Certification Program . . .

(Concluded from last issue)

The common method of approach to this all-important fundamental of successful citrus growing has been simply to go into a block believed to be of the right variety and cut buds within easy reach. It has been a common practice in this state to take budwood from young nursery trees without any knowledge of what kind of fruit they will produce, what diseases they may have, or what the parent tree they came from looks like. Even when propagated vegetatively, young trees retain juvenile characteristics so that even if they had fruit on them at the time the budwood was taken, that fruit may not be any indication of the kind of crop they would finally produce. We have found groves in this state where 95 percent of the trees showed genetic variation. These of course were Valencia groves and point up the fact that in the absence of any systematic selection of budwood, we may very conceivably get so far away from the true Valencia by improper selection or non-selection of our budwood, that none of our strains will remain true to type.

In other words, if we are to maintain a standard variety of citrus we must take budwood only from the best trees of the most superior strains of that variety, and then only from limbs producing uniform fruit that is true to type. I know one contract budder whose idea of a good stick of budwood is a big club from a water sprout inside the tree. Propagation of this type of budwood is very undesirable. Buds taken from these sprouts will be very slow to fruit. This man of course likes this type of budwood simply because it is easy for him to handle, and he will continue to use it as long as the grower allows him to use it. If we continue non-selection or random selection of our budwood for the next 25 years as we have in the past 25 years, it seems quite possible that some of our more instable strains of citrus may disappear.

We feel that this is a very important part of our work—probably as important as the virus phase—and this year we have gone a long way toward bringing it to the attention of the participants in the Program. Two of our largest nurseries are already beginning systematic bud selection as well as 3 of the state's largest grower cooperatives. Even though it will be



GERALD G. NORMAN
IN CHARGE
CITRUS BUDWOOD CERTIFICATION OFFICE
AT SUB-TROPICAL FRUITS
INSTITUTE, LAKE PLACID

several years before they begin to benefit from this work, they are at least aware of the need for it and have made a start. I am confident that all the other participants in the Program will soon be using an organized bud selection system.

Since we started this Program almost 2½ years ago we have had applications for 834 parent trees from 46 participants in 16 counties. Of the 834 trees applied for, we were able to find 714 that were acceptable candidate trees. To date, we have dropped 200 of these trees for cause, so that we now have 514 candidate trees remaining in the Program. In addition to these 514 candidate trees, we have 222 first generation Scion Grove trees budded from candidate parent trees, and over 12,000 young nursery trees which may be used as scion trees provided the parent tree survives the tests and are finally registered. All the surviving 223 candidate trees entered in 1953 will be registered as Psorosis free as fast as our office can process the registration forms and get them out to the participants.

This will be a limited or provisional type of registration and applies only to freedom from Psorosis.

To summarize this report, I believe that if the work of Budwood Certification were stopped today or tomorrow we would still have made two contributions to the future of Florida's citrus industry. First, we have helped to make our growers aware of the economic losses they have suffered because of virus diseases, and even more important, that they can do something about those losses; and second, we have demonstrated to them the absolute necessity for systematic bud selection if they are going to grow stable, uniform fruit crops.

As to the future, I personally would like to see as the third phase of our work at least one geneticist attached to the Program to do plant breeding for the Florida citrus industry, not necessarily to develop more varieties since we may already have too many for our own good, but to improve and stabilize and standardize the varieties we already have.

Right now a late maturing Pineapple or a Valencia maturing 6 weeks earlier than our normal crop would be worth a lot to us. I believe that such a fruit could be rapidly developed by selection from existing trees, and that this work should logically be a part of the Certification Program—that this selection might begin from among trees that have already been tested for 2 years. If we can afford plant breeders to work on strawberries, string beans, and slash Pine, surely we can afford one to work on citrus. All we have to have is just one really fine tree of each variety and when that tree is found, budwood from it should be made available to all our growers at cost.

I believe also that our work should eventually undertake the selection and testing of certified citrus seed—that trees used as seed sources should be tested and registered just as trees used as budwood sources are registered.

The last thought I would like to leave with you is this. You have given us your complete cooperation, now I would like to ask for your patience. It may be hard to believe but two or even five years is not very long to do this kind of work. In the meanwhile, like that famous milk cow that Bob Edsell talks about, we will give you everything we've got.

Trace these 3 steps to Citrus Profits after use of **HYBRO-TITE***

Nature's own 20-Mineral Soil Conditioner



Hybro-Tite and good grove caretaking are responsible for the healthy bloom and foliage of these trees, says Mr. Ray Clements, Lakeland, Florida.

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**Potash—plus aluminum, silicon, sodium, titanium, calcium, phosphorus, magnesium, iron, manganese, strontium, yttrium, silver, zinc, zirconium, lead, chromium, nickel, copper, vanadium.

Do you want to improve your groves...
add to your citrus profits?

● If you do, just trace the steps taken by Mr. Ray Clements of Lakeland, Florida, whose grove, at the time he acquired it, was in a somewhat run-down and unthrifty condition.

1 HYBRO-TITE APPLIED! In December, 1953, Mr. Clements applied Hybro-Tite, the natural rock soil conditioner supplying potash and 19 trace minerals.** Hybro-Tite is so low in cost and so easy to use—and its benefits have been so marked—that more and more citrus growers are using and praising it.

2 50% IMPROVEMENT IN 11 MONTHS! Eleven months after the application of Hybro-Tite, Mr. Clements reported, the trees looked at least 50% better than they had a year before...the improvement in foliage and general tree condition caused considerable comment from experienced citrus growers.

3 ALLURING OFFERS TO PURCHASE! "This interest on the part of other citrus growers resulted in attractive offers to purchase," says Mr. Clements. "Early this year an offer became alluring enough to persuade me to sell.

"The enclosed picture (left) was taken in the same grove last week. The healthy bloom and foliage make it a beautiful sight. Actually, I would be sorry that I sold this property except that I now feel confident that if I wish I can purchase another grove in poor condition and bring it to the same degree of perfection through the use of Hybro-Tite and good grove caretaking."

TRY HYBRO-TITE NOW... the sooner the better! Hybro-Tite's minerals are gradually released to feed the rootlets. A test on your own grove is the best way to find out whether it will produce the same remarkable improvement reported by Mr. Clements. For complete information, write today for this free booklet, "Nature's Own 20-Mineral Soil Conditioner."

POTASH ROCK COMPANY OF AMERICA, INC.
Box CM-6, Lithonia, Georgia

STUDIES ON THE USE OF MALATHION ON CITRUS

(Continued from Page 11)

populations of chaff scale much higher than where no scalicide was used. Furthermore, the lower the dosage the greater was the discrepancy between the treatment and check populations. The reasons for this phenomenon are not known, but since there was an 85 percent decrease in chaff scale where no scalicide was used, it is possible that malathion upset the mechanism of natural control. Parathion at .15 per 100 gallons of spray gave excellent control.

Chaff scale was increasing rapidly when a second test was put on in July. In this case as good control was obtained with 1.00 pound of malathion as with .15 pound of parathion.

Soft Brown Scale

Good commercial control of soft brown scale has been obtained with both .75 pound of malathion and 1.3 percent oil emulsion. Neither has had any more effect on the incidence of parasitized or diseased soft brown scale than the other. Parathion has failed to control this insect.

Rust Mite

Malathion, like parathion, kills rust mites but gives no lasting control. For example, 3 pounds of 25 percent wettable powder was compared with 1 pint of 57 percent malathion emulsifiable liquid and with 1.5 pounds of 15 percent parathion wettable powder per 100 gallons of spray. No wettable sulfur was used in any of these sprays. Pre-spray rust mite populations on fruit ranged from 1 to 5 percent on May 5. On June 2, only 28 days later, 95 percent of the fruit was infested on unsprayed trees, while 33 and 32 percent of the fruit was infested on trees sprayed with parathion and malathion wettable powders. Where malathion emulsifiable liquid was used 58 percent of the fruit was infested. Where sulfur was used, neither malathion nor parathion significantly increased the control of rust mites obtained with sulfur.

Purple Mite

In 1952, as shown in Table 5 malathion at .75 pound applied July 28, August 28, and October 2 gave no better results than .15 pound of parathion applied on the same days. A standard 1.3 percent oil emulsion was superior to either material. In 1954, as shown in Table 6, dosages of .33 and .62 pound of malathion gave a shorter interval of control of purple mite than did .15 pound of parathion. Dosages of .75 and 1.00 pound of malathion, on the other hand, were su-

perior to parathion. One pound of malathion, applied in February, was inferior to aramite at 0.3 pound of active ingredient per 100 gallons. Malathion at 1.25 pounds per 100 gallons was slightly superior to DN 111 at .25 pound of active ingredient applied in November. There is therefore no indication that malathion has any practical value as a miticide for Florida citrus, but there is some slight evidence that in certain cases purple mite may be less of a pro-

blem following malathion than after parathion. Even this slight advantage in favor of malathion is of doubtful significance.

Table 6.
Comparative Efficiency of Parathion and Various Amounts of Malathion against Purple Mite.

Materials in Pounds per 100 Gallons Malathion and Parathion Expressed as Active Ingredients - Sprays Applied April 22, 1954.	Percentages of Infested Leaves			
	April 19 (pre-spray)	May 4	May 17	June 1
Malathion .38, wettable sulfur 5	21	15	20	58
Malathion .62, wettable sulfur 5	22	23	28	48
Malathion .75, wettable sulfur 5	30	10	14	35
Malathion 1.00, wettable sulfur 5	23	4	7	20
Parathion .15, wettable sulfur 5	23	8	15	42
Wettable sulfur 5	24	19	21	54

blem following malathion than after parathion. Even this slight advantage in favor of malathion is of doubtful significance.

Toxicity to Trees

Malathion is apparently not injurious to citrus trees. Amounts as high as 1.50 pounds of technical malathion per 100 gallons of spray have been used on Valencia orange trees with no sign of injury to either fruit or foliage. Dosages as high as 1.25 pounds per 100 gallons have not injured Duncan grapefruit, tangerines, or Pineapple oranges. Although malathion has been used when temperatures were as high as 95 degrees F., on trees in need of water, and on trees weak from heavy infestation of scale insects, no visible injury has been noted. It has not, however, been applied to the same trees over a long period of time, so any effects of continuous usage have not been determined.

Discussion

The information gained to date and presented in this paper indicates that malathion can be used effectively for certain pest infestations on Florida citrus. Good control of low infestations of purple and Florida red scales has been obtained with dosages of 3 to 5 pounds of 25 percent wettable powder or 1 to 2 pints of 57 percent emulsifiable liquid per 100 gallons of spray. Three pounds of 25 percent wettable powder have given excellent control of soft brown scale, but control of chaff scale and heavy infestations of purple and Florida red scale has not been consistent and adequate dosages have not been determined.

There have been no indications that malathion adversely affects citrus trees. Although malathion is not recommended for general citrus use, it is suggested that it be tried on a limited basis, particularly where a scalicide is needed and it is impractical to use either oil emulsion or parathion. Malathion may be tried for the control of purple, Florida red, and soft brown scales at dosages of from 3 to 5 pounds of 25 percent wettable powder or from 1 to 2 pints of 57 per-

cent emulsifiable liquid per 100 gallons of spray. If the lower amount is used, it should be used with the expectation that a second application may be needed. Malathion should be used only against low infestations for maintenance purposes with timing of spray applications the same as for parathion. Until additional information is available, malathion should not be used against chaff scale or where there is a heavy infestation of either purple or Florida red scales.

Although both purple mite and rust mite are readily killed by malathion, neither is controlled for an adequate period by this material.

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1. Lehman, A. J. Association of Food and Drug Officials of the United States. 15 (4). 1951.
2. Ebeling, Walter. DDT preparations to control certain scale insects on citrus. J. Ec. Ent. 40: 619-632. 1947.

REVISED U. S. STANDARDS FOR FLORIDA TANGERINES

Revised U. S. Standards for Florida Tangerines will become effective September 12, the U. S. Department of Agriculture has announced.

The standards are revised to clarify the definition of "fairly well colored" which is applicable to the U. S. No. 1 grade, in order to obtain better uniformity in the interpretation of color. In addition, the term "mature" has been redefined so that future amendments to the Florida Citrus Code regarding maturity will not necessitate revision of the standards.

Florida Orange Juice Popular With Sailors

Sailors aboard a U. S. submarine tender are extremely partial to Florida orange juice and keep a coin-operated machine working so steadily that the supply officer would like to have a dispenser with twice the capacity of the present 400-cup unit.

The enthusiastic reception given orange juice by the personnel aboard the tender is outlined in a report just received by Capt. Kenneth C. Ekelund, of Florida Citrus Mutual's dispenser division. The same enthusiasm is reported among sailors from submarines who have access to the citrus juice while their underwater craft are tied up alongside the tender for servicing.

Captain Ekelund, a retired 30-year Navy man, has been seeking to have more citrus juice dispensers placed in operation in all branches of the military forces.

Orange juice far outsells other types of beverages, the supply officer informed Captain Ekelund. Most of the time, the vending unit is available to approximately 1,000 men, including personnel from the two submarines usually tied up to the tender, one on each side, for repairs and servicing.

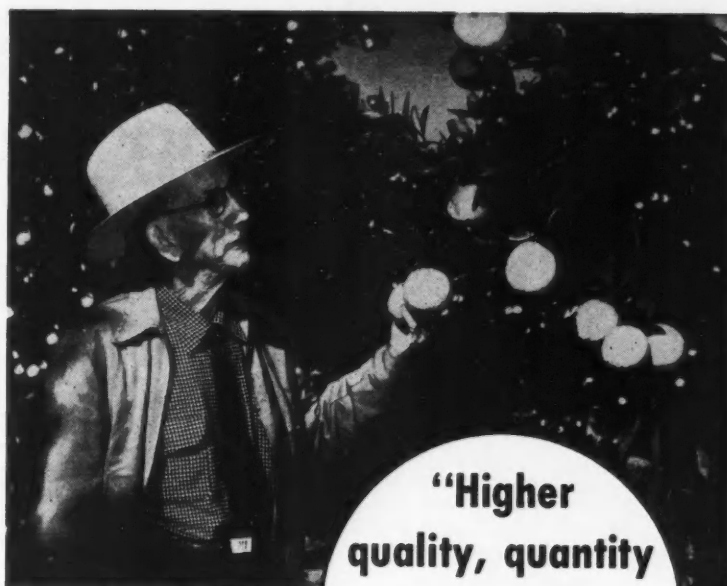
The supply officer advised that "the demand for orange juice was tremendous, as we had anticipated. When both that machine and our cola drink machine are operating, the orange juice machine receives much the greater play."

He would like a much bigger dispenser, the supply officer reported, because "it is practically impossible for the assigned man to service each vending machine more than once a day and still perform his other duties."

"As a result, the orange juice machine with its 400-cup limitation, registers 'empty' while the other machines continue to serve our patrons. We would like to have a 600 or 700-cup capacity orange juice machine. This would be particularly important over week-ends and holidays."

When sufficient experience has been logged, a formal report will be made by the supply officer to the Navy's Bureau of Ships and the Navy's Ship's Store Officer.

The unit aboard the submarine tender is in effect a "pilot" installation, Captain Ekelund said, "and we hope the report finally made will set the pattern for similar installations aboard all types of Navy vessels and also at land stations."



Wesley J. Mann, Frostproof, pioneer Polk County citrus grower, inspects his d/p DOLOMITE-conditioned crop.

**"Higher
quality, quantity
and better
solids content"**

... says Wesley J. Mann, veteran
Frostproof citrus grower

Mr. Mann is thoroughly convinced that d/p DOLOMITE pays off heavily in greater citrus profits.

"Since I have been using d/p DOLOMITE, which has been more than 15 years, I've been getting finer quality, greater yield, better solids content and earlier maturity," he says.

"Some years ago I stopped using d/p DOLOMITE for awhile. I soon found my groves deteriorating and yield lighter.

"For the past 3 years I have been using about one ton per acre and have been able to observe grove improvement and better, bigger crops.

"I've found the free soil laboratory and fine field service of d/p DOLOMITE most helpful to me."

Use d/p DOLOMITE on YOUR groves and get the same benefits that have made Mr. Mann and many others ardent enthusiasts for d/p DOLOMITE. d/p DOLOMITE restores acid-alkali soil balance and supplies the calcium and magnesium essential to healthy plant and animal growth.

Dolomite Products has a complete line of liming materials—Dolomitic and Hi-Calcium Limestone bagged and bulk. Also dried Hi-Calcium Limestone bagged and bulk.

For information or arrangements to have a d/p DOLOMITE field representative call on you, write, wire or phone the address below—or see your local spreader.



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Work Started On Eradication Of Spreading Decline

Several months ago a committee named by the State Plant Board appointed an industry committee to work out details for combatting spreading decline which has been making serious inroads into many of the state's citrus groves.

The men named to the committee were: J. F. Alexander, Bartow, Chairman; Franklin Ward, Avon Park; Leo H. Wilson, Bradenton; William Bishop, Citra; Vernon Saurman, Clearwater; Herbert Bolton, Dade City; Morton Howell, Dade City; Floyd Wray, Davie; Douglas R. Igou, Eustis; Wilbur Charles, Florence Villa; Milton Link, Ft. Lauderdale; Perry Murray, Frostproof; Latt Maxcy, Frostproof; Lacey Thomas, Groveland; Howard Thulberry, Lake Wales.

Byron Herlong, Leesburg; G. W. Pringle, Leesburg; Grant Morthland, Ocala; Hugh Lalor, Opa Locka; A. H. Whitmore, Orlando; Chas. P. Fawcett, Orlando; R. K. Voorhees, Orlando; Dr. Wallace R. Roy, Plymouth; T. G. Mixson, St. Petersburg; J. B. Prevatt, Tavares; R. S. Edsall, Vero Beach; Dale Talbert, Vero Beach; W. C. Graves, Vero Beach; C. D. Kime, Jr., Waverly; Frank Chase, Windermere; Harry M. Smith, Winter Garden; Dr. J. T. Griffiths, Winter Haven; Frank Holland, Winter Haven.

As a result of the efforts of this committee the state legislature appropriated \$1,756,300 to aid in combatting this disease and the federal government added another \$100,000 to aid in the research and corrective measures to be taken against this disease.

NEW COMMITTEE

Later on this committee was released and the Plant board appointed another committee to serve as an advisory group to the board to serve as a consulting body.

This committee is composed of: Wilbur Charles, Florence Villa Citrus Growers Association; Morty Howell, Pasco Packing Co.; Allen Wilson, Minute Maid Corporation; Harry Smith, Winter Garden; and Charlie Kime, Waverly Growers Cooperative.

Shortly after the original committee had been released by the Board an industry group appointed the original group with the addition of J. S. Morton as an independent committee to carry on their efforts in developing further information and especially

to seek additional funds from the federal government for the purpose of overcoming this drastic spreading decline encroachment on so many Florida citrus groves.

A huge bulldozer has started pushing out citrus trees as part of the vast containment program authorized by the state legislature.

State Plant Board officials using borrowed equipment kicked off the containment fight which they expect to eventually carry to more than 5000 acres of infested citrus land in 22 Central Florida counties.

The State Plant Board hopes to see the monumental task of searching out and destroying the nematode completed in 12 months, barring unforeseen complications.

The grove work is on a request basis, with applications to be made to the State Plant Board either in Gainesville or Winter Haven.

While a vast preponderance of the dreaded citrus infestation is to be found in Polk and Highlands Counties, scarcely a single major grove area is totally free of the tiny worm which rages through groves regardless of rootstock or location.

The 15-acre tract of grapefruit grove owned by Winter Haven resident A. M. (Bun) Tilden was designated as the opening skirmish site for the historic fight which the state is financing to the tune of more than \$1,750,000.

After citrus trees are pushed out and burned, all roots and other remaining portions of the trees will be raked together, burned then fumigated with a chemical solution—DD—which has proven successful in killing the nematode responsible for spreading decline.

Two specially designed land fumigation units are being constructed for the plant board, and will be able to shoot the DD compound 12-15 inches under the surface of some 10-15 acres of cleared groveland daily.

Land Idle Two Years

A two-year period of non-cultivation will be enjoined after treatment, and the land by this method made usable for citrus tree plantings again, provided no effective remedy is developed in the meantime.

Ed L. Ayers, on hand for the kickoff of the citrus belt-wide program, indicated he hopes to have citrus grove

owners hire private bulldozer operators to handle push-out work, to speed the containment program.

Florida Fruit And Vegetable Assn. Meets October 4th

George H. Cooper, Princeton, General Chairman of the Florida Fruit and Vegetable Association's 12th Annual Convention has released details of a tentative program for the event which opens October 4, at the Hotel Fontainebleau, Miami Beach.

Cooper said, "Registrations begin on the morning of the 4th. The first scheduled event is a buffet luncheon at noon. At 2 P. M. the first business session will begin, highlight of which will be the keynote address. There will be a Fashion Tea for the ladies — to which the men will be invited.

"Wednesday's event will begin with a Cracker Breakfast, followed by Bingo for the ladies and the second business session for the men. At noon the ladies will be guests on a boat trip for luncheon and a tour of scenic waterways.

"The third business session will be held Wednesday afternoon and will include the annual membership meeting and elections of directors for the following year. The annual banquet and presentation of awards will be on Wednesday evening followed by entertainment and dancing.

"The final business session will be held on Thursday morning, with adjournment at noon."

"The committee is continuing to work so that we will enjoy a fast moving program and a fair share of interesting social and entertainment features at this convention," Cooper added.

When song writers in Elizabethan England wanted inspiration, they didn't have to go to a pub, but could instead go to the jail. According to John H. Long, in the University of Florida Press book, "Shakespeare's Use of Music," it was one of the customs of the song writers to make songs out of the confessions of criminals.

USDA Announces New Lemonade Powder

Lemonade powder rich in natural flavor is a new development of the U. S. Department of Agriculture designed to help make the dog-days of summer more tolerable. It's the latest of several easy-to-use fruit powders produced at USDA's Western Regional Research Laboratory in Albany, Calif.

One of these powders — from orange juice — is already in commercial production. So far, however, it is packaged only for institutions, food manufacturers, and other large-scale users; not for direct family consumption. Food processors are also interested in the laboratory's tomato-juice powder. Neither this product nor the lemonade powder are yet being manufactured.

Like the orange-juice and tomato-juice powders, the lemonade powder is easy to ship and store and requires no refrigeration. It dissolves instantly in cold water to make a beverage equal in flavor and nutritive value

to lemonade prepared from freshly squeezed juice.

Scientists of the Department's Agricultural Research Service laboratory at Albany prepare this new fruit powder from lemon juice and sugar, adding only a trace of lemon oil stabilized in a soluble carrier. Essentially, the powder components are the same as those present in lemonade made from fresh lemons — only the water is missing. An in-package dessicant (a small envelope containing a moisture-absorbing agent) is used in the package product to reduce the moisture content of the powder to around 1 percent or less, thus helping to preserve its quality in extended storage.

The powder is produced by a puff-drying process worked out at the Albany laboratory. It involves drying a concentrate of fresh lemon juice under vacuum and moderate heat, followed by rapid cooling, so that a porous, puffy crystal structure is formed. The puff-dried material is then broken up, ground, and packaged. This same technique is now being used commercially to manufacture the orange-juice powder.

PROGRAM PLANNED FOR LADIES ATTENDING FFVA CONVENTION

Ladies attending the 12th annual Convention of the Florida Fruit and Vegetable Association at Hotel Fontainebleau on October 4, 5 and 6 will enjoy an elaborate program of entertainment offered with genuine Florida hospitality, according to Mrs. Roy Vandegrift, Jr., Pahokee, chairman of the Women's Activities Committee for the Convention.

"Realizing that we will have as guests ladies from all parts of Florida, from many other states and from several foreign countries, the Women's Activities Committee has planned a program of wide interest.

"Entertainment will include an elaborate buffet luncheon, a bingo game, with prizes, a style show of Miami's finest fashions, a scenic boat ride and a shopping trip to Miami Beach's most exclusive shops.

"The Committee in charge of the various functions have so capably and enthusiastically made their plans that there is little doubt that this will also be a success to equal past meetings which have been noted for their splendid entertainment.

"The women of the Association most cordially invite and urge wives and other members of the families of both members and guests to attend," said Mrs. Vandegrift.



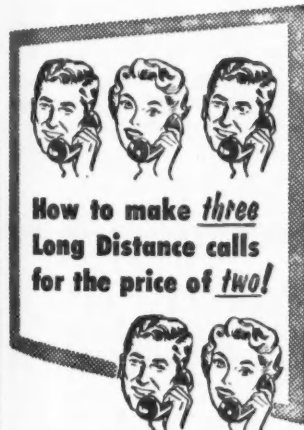
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Florida Farm Statistics 1953-54

LAND UTILIZATION, PRODUCTION AND VALUE

According to the U. S. Census there are 34.7 million acres of land in Florida. Of this amount nearly 45 percent was in farms or approximately 16.5 million acres. This represents a 3.4 million acre increase during the five-year period from 1945. This increase was mainly in pasture land. There were close to 57,000 farms in the State at the time of the 1950 Census. Of the 16.5 million acres on Florida farms less than 21 percent was in cropland, the remainder being in pastures, woodland pastures and other woodland. Land on which Florida's large assortment of 39 different crops were grown in 1954 totaled nearly 2.4 million acres, or about the same as the plantings of 1953.

Paced by a record 133 million citrus crop in 1954, crop production in Florida for the year excelled all records. The total production of 8,567,100 tons of food, feed and fibre in 1953-54 compares with 7,275,600 tons for the year before and a previous record 7,566,900 tons in 1951-52. The value of production of crops produced in 1953-54 approximated \$400 million — 7 percent greater than the 1952-53 valuation of \$374 million. Citrus, fruit and tobacco accounted for most of the increase.

FRUITS AND NUTS

A 29 million box increase in the citrus crop in 1953-54 boosted the total production of Florida's fruits and nuts from 4,828,500 tons in 1952-53 to 6,062,500. Smaller crops of avocados, peaches, pecans and tung nuts were produced in 1954. While the per unit price of citrus was lower in 1954, the large volume increased the all fruit valuation to nearly \$197 million — nearly \$30 million above a year ago.

Florida leads all other States both in acreage of bearing trees and production. In 1953-54 there were 480,300 acres of producing citrus groves in Florida, out of the 808,900 acres in the United States. California, Florida's nearest competitor, had 263,100 acres, while Texas in third place accounted for 44,770 acres. Arizona, with 16,200 acres and Louisiana with 4,500 acres are the only other States with any appreciable citrus acreage. The Florida bearing acreage is composed of 339,600 acres of oranges, 111,300 grapefruit, 23,300 tangerines

and 6,100 limes. A breakdown of the nearly 139 million boxes of citrus produced in Florida during 1953-54 season reveals 91,300,000 boxes of oranges, 42,000,000 boxes of grapefruit, 5,000,000 boxes of tangerines and 370,000 boxes of limes.

General Crop Report As Of Aug. 1, 1955

FLORIDA

Weather conditions during July were generally favorable for Florida crops. Rainfall was fairly well distributed in the general farming areas. Temperatures were slightly below normal.

FIELD CROPS — The cotton crop in Florida is estimated at 22,000 bales compared with 25,000 bales last year. The indicated yield per acre is about the same as last year on the reduced acreage. Prospective corn production is 11,248,000 bushels which is about 22 percent over last year.

Florida's flue-cured tobacco crop is indicated at 26,780,000 pounds. This is about 3 percent less than last year's production. This year's expected yield per acre is 1300 pounds compared with 1290 pounds last year. The shade tobacco crop, Type 62, in Georgia and Florida, is estimated at 6,370,000 pounds which is also about 3 percent less than last year's pro-

duction.

The acreage of peanuts for picking and threshing is estimated at 58,000 acres compared with 55,000 acres a year ago. The yield per acre is indicated at 900 pounds compared with 810 pounds last year. This year's soybean crop at 34,000 acres shows an increase of 17 percent. The indicated production at 680,000 pounds is nearly double last year's crop.

UNITED STATES

CITRUS — Citrus groves were generally in good condition on August 1. A generous sprinkling of July bloom was evident on many areas. The reported condition on Aug. 1 for oranges was 69 percent. This was 4 points higher than a month earlier, but was 6 points lower than August of last year and 2 points below average. The grapefruit condition at 68 was 6 points higher than a month earlier, and 6 points above August of last year. Tangerines at 62 were 8 points lower than a year ago.

CITRUS — Prospects for the 1955-56 citrus crops are fairly favorable. Growing conditions during July were favorable in all areas. Texas citrus received some rain during July, and there is still plenty of water for irrigation. Many young grapefruit trees will bear for the first time this season. Arizona prospects are only fair. California prospects for citrus from the 1955 bloom are generally favorable although July weather was cooler than usual. Movement of the 1954-55 Valencia crop continues in volume. This crop was about one-half harvested by August 1.



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Growers Back Solution Of Air Pollution

The federal government may be asked to lend a helping hand in combatting air pollution in the Polk county area, believed caused by the release of highly toxic fluorine gas incident to the mining and refining of phosphate.

Florida Citrus Mutual has furnished a special state legislative committee with copy of a new federal law, approved by President Eisenhower, which gives the surgeon general of the U. S. Public Health Service the authority to cooperate with state and other agencies in finding out what is causing the pollution and what can be done to purify the atmosphere.

Mutual's general manager, Robert W. Rutledge, said the new law had been called to the attention of Rep. Perry Murray of Polk county, chairman of the special state committee which will investigate the pollution problem and recommend what should be done about it.

Mutual called the legislature's attention to the situation after a number of its members with groves in Polk county claimed polluted air was damaging their fruit trees. Cattle-men also claimed the polluted air had caused the deaths of some of their animals.

The federal law recognizes "the dangers to the public health and welfare, injury to agricultural crops and livestock, damage to and deterioration of property, and hazards to air and ground transportation, from air pollution." It is the policy of congress, the law states, "to preserve and protect the primary responsibilities and rights of the states and local governments in controlling air pollution, to support and aid technical research to devise and develop methods of abating such pollution, and to provide federal technical services and financial aid to state and local government air pollution control agencies" in seeking to control the problem.

The law authorizes an appropriation of \$5,000,000 a year for the next five years. The funds, when available, would be used to make grants-in-aid to state and local government air pollution control agencies and other public and private agencies and institutions, and to individuals, for research, training and demonstration projects.

The special committee headed by Murray, who also is president of Mutual, was given \$20,000 by the legislature to finance its investigation. No date for its first meeting has been set, with the legislature tied up in special session trying to pass a satisfactory reapportionment law.

HILLSBOROUGH GROWERS PLAN NEMATODE CHECK

South Hillsborough County farmers will benefit by a program started by Assistant County Agent M. C. Jorgensen.

The area initiated a program to

study possible control of some of the nematodes by "some methods of cultural practices."

Nematode checks will be made at the Gulf Coast Experiment Station, Jorgensen says, and records will be kept, at the agent's office, of the various treatments of the pasture fields brought back into vegetable production.

Hastening stove fires with gasoline or kerosene takes a heavy toll of farm lives and property. Do not use kerosene, gasoline or other flammable liquid to boost fires in stoves, ranges or fireplaces.



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Reports Of Our Field Men . . .

HIGHLANDS AND POLK

J. K. Enzor, Jr. & R. E. Lasalter, Jr.

Many localized areas in this section are beginning to get dry again. While some areas have had an abundance of rain others have not had any during the month of August.

Some groves have had an extensive late bloom, especially on oranges. This bloom was not at all general, but where it did occur it was heavy. It occurred during July and August rather than in June.

Many growers are in the process of applying dolomite or limestone at this time. Soil samples should be taken and where the Ph values are low a soil amendment should very definitely be applied.

Young trees should be receiving another application of fertilizer at this time and in the colder locations this should be the last application for the year.

Growers should continue to check their groves for rust mites. This is especially important where oil has just recently been applied. These insects can cause considerable damage at this time of year.

We have been seeing more purple mites than usual for this time of year. However, there is no particular danger at this time.

NORTH CENTRAL FLORIDA

V. E. Bourland

Weather hot, rains still spotted, but not too much so far in any place. We feel that we are very lucky that the storm so far passed us by. Groves are looking good, but fruit seems to be short in most of groves. The June bloom in some groves will help out some. Cover crops are good, and young trees have made good growth this season.

Pastures are all good, and cattle in good shape, but market is not what the cattle owners would like.

EAST HILLSBOROUGH AND PASCO COUNTIES

E. A. McCartney

Gone fishing.

WEST HILLSBOROUGH AND PINELLAS COUNTIES

J. A. Hoffman

Rains have been very spotted this summer. Even though there has been sufficient rainfall to carry groves through. Lakes and ponds are about three feet lower than they should be for this time of the year. Much rain will be needed to bring the lakes and ponds back to their normal level before fall.

Next year's crop of fruit appears to be light on most varieties with the exception of grapefruit. A heavy July bloom appears to have set on Valencia oranges.

A heavy infestation of rust mite has followed the application of summer oil. A close check should be kept on rust mite.

Young trees should be hoed and fertilized the first of September as to harden before winter.

SOUTH POLK, HIGHLANDS, HARDEE AND DESOTO COUNTIES

C. R. Wingfield

After my return from vacation I found the first two weeks of August was without any appreciable rainfall and in some sections the groves were beginning to show some wilting. However, at this writing there has been showers in some areas with indications there will be more. The trees are looking good and fruit is sizing fairly well. The late bloom appears to be setting very well especially on those trees that were lightly cropped.

Rust mite and scales has been very bad this summer. Altho correction measures were made there will be a lot of Mite damage. Where the cover crop has seeded the growers have begun to chop making ready to incorporate it into the soil. After cover crop has been cut it will be well to make a thorough check for rust mite.

Vegetable growers are making ready to put in their vegetable crops and the acreage will be about normal as far as can be estimated at this time.

SOUTHWEST FLORIDA

Eaves Allison

Low prices for grapefruit has been the cry for a long time, and I understand there has been a big appropriation for advertising for the coming season on this fruit. My observation has been that this fruit would stand a much better chance of becoming profitable if the public could just buy the juice. If you think that is easy try counting the drug stores, drink stands, restaurants and hotels in Florida where you can get grapefruit juice — any kind — fresh, canned or frozen. You will find one in twenty will be a high percentage, and this will include the big chains like Howard Johnson's, Liggett's Walgreen's, etc.

Just for example, and to me a glaring one, there was no grapefruit juice to be had at the Citrus Institute two day meeting at Lake Placid this summer, altho a big dispenser put out cold orange juice and another dispensed lime-ade. Same situation exists at the cold drinks departments in the commissaries of some of our largest fertilizer companies serving the citrus industry. Grapefruit juice? no, we aint got none.

From now on I'm a'takin' a can with me when I go into a restaurant for breakfast!

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*Uncle Bill Says:*

We notice in a recent issue of our favorite daily paper that vast acreage of citrus groves in California are being cleared of trees, subdivided and sold to the thousands of prospective home owners, who like in Florida is now creatin' a housin' boom in California.

Tain't been but a little while ago since we heard and read about thousands of acres once devoted to raisin' citrus in Texas, due to killin' cold and other reasons was now being plowed up and planted to cotton and other crops.

So it seems that more and more of the world's supply of citrus is goin' to be produced right here in our home state of Florida . . . so it seems that all three of the biggest citrus producin' states in the union is going to be made happy . . . California for the tremendous number of new homes that they have and are goin' to get . . . Texas with it's new and profitable crops, which is less affected by the cold . . . Florida with its constantly increasing supply of citrus fruit and citrus by-products, making it the biggest citrus producin' spot in the world.

And that's the way we like to see it . . . with everybody happy.

Of course, we're havin' some troubles . . . but there never has been a time in the history of the citrus industry in Florida that we haven't been able to lick anything that threatened our citrus 'n we're jist as sold as we can be that this spreading decline and any other problem which may affect our citrus crops will be licked jist like we've licked all the other problems which has affected our citrus crops in the past.

'Course they is foks that call us an optimist . . . and we feel sort of flattered every time anyone says anything like that to us . . . 'cause if they is anyone we ain't got no use fer it is a chronic pessimist . . . we always figgered that even when things was bad the optimist had a lot better chance of landin' on top than the pessimist.

Guess one of the main reasons we've always been an optimist is on account of the fine crops we've always managed to raise with Lyons Fertilizers.

U.S. Farm Exports Up 7 Per Cent In Year

The U. S. Department of Agriculture today estimated that United States agricultural exports in the year ending June 30, 1955 totaled \$3,130 million in value, an increase of 7 percent over the 1953-54 total of \$2,936 million, and 11 percent more than the 1952-53 total of \$2,819 million.

(A copy of the July issue of the Foreign Agricultural Trade Digest contained details regarding United States agricultural exports in 1954-55 may be obtained from the Foreign Agricultural Service, Room 5922, Phone: REpublic 7-4142, Br. 2445).

Actual exports for July-May 1954-55 were 7 percent larger. June shipments were estimated at about the same as for June, 1954 when they totaled \$266 million, and 16 percent above the May, 1955 total of \$228 million.

Through May 1954-55 all major commodity classes showed improvements except grains, but with an upsurge in grain shipments in June — an estimated \$93 million worth compared

with \$59 million in June, 1954 — the grain total of \$886 million estimated for the fiscal year as a whole was about the same as in 1953-54.

Exports registered gains in 1954-55 mainly for vegetable fats and oils and livestock products, but increases also occurred in cotton, tobacco, and fruits and vegetables.

Improvement in economic conditions abroad, accompanied by the strong international financial position of countries which are the best customers for United States agricultural products, exerted a stabilizing influence on agricultural exports in 1954-55. This greater strength was manifested in the increased liberalization of dollar imports. A prosperous European economy was the main factor in the overall United States farm export situation, although a large share of the improvement in the

grain trade stemmed from Europe's poor harvests in 1954.

Satisfactory levels of gold and dollar accumulations attained during the year made it possible for some countries to expand dollar purchases. However, some European countries maintained restrictions, some of which were discriminatory, against imports of United States farm products. United States agricultural exports would have increased further if foreign demand had been able fully to assert itself. With large supplies on hand, Government programs facilitated the flow of farm products abroad. The most important of these programs were sales for export at competitive prices, sales for foreign currencies, barter arrangements, grants to foreign countries for emergency famine relief, and welfare donations abroad.

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HOT SPRINGS

NATIONAL PARK,
ARKANSAS

USDA Proposes Revision Florida Or'ge Standards

A revision of existing U. S. Standards for Florida Oranges was proposed by the U. S. Department of Agriculture. These standards, when promulgated, will supersede those effective since September 28, 1952.

During the 1953-54 season about 96,000,000 boxes of oranges and tangerines with a sales value of over \$158,000,000 were produced in Florida. Sales of fresh fruit accounted for about 31,000,000 boxes, and the balance was processed. Approximately 49,000,000 boxes of oranges were utilized for making frozen concentrate.

The principal reason for revising the standards at this time is to make them applicable to tangelos as well as oranges. The tangelo is not an orange but is a hybrid between a tangerine or mandarin orange and either the grapefruit or pummelo. In addition to including tangelos as part of the title of the standards, other principal changes are the addition of minimum diameters for various pack sizes of Temple oranges and tangelos, deletion of the maximum diameters for the various pack sizes of oranges packed in 1-3/5 bushel boxes, and deletion of the 200 size pack. The term "mature" has been redefined to include maturity requirements for tangelos. Also, the definitions of damage, serious damage and very serious damage by dryness or mushy condition have been reworded so as to include tangelos.

Interested parties have until September 19, to submit written views or comments on the proposed standards to E. E. Conklin, Fresh Products Standardization and Inspection Branch, Fruit and Vegetable Division, Agriculture Marketing Service, U. S. Department of Agriculture, Washington 25, D. C.

FRUITS, VEGETABLES

NEED COOL STORAGE

Most vegetable and fruit storage must be dark, cool, moderately humid and well ventilated.

It also must be well insulated, so the product will neither freeze nor become wet from water condensation dripping from walls or ceiling.

Horticulturists say storage that meets these conditions will keep, all winter long, such crops as late cabbage, late celery, parsnips, potatoes, beets, carrots, apples and pears.

EMJEO

(80/82% MAGNESIUM SULPHATE)

Many years a favorite source of soluble magnesia for Florida soils. Used extensively in fertilizer mixtures for citrus crops and vegetables. Especially useful and economical for direct application where only magnesia is required.

Florida growers now consider magnesium a primary plant food in the same category with nitrogen, phosphorus and potash.

The recommendations of the Florida Citrus Experiment Station at Lake Alfred, published in January 1954, stress the need for large application of magnesium for Citrus in soluble form and state that it is usually applied as a Sulphate.

Ask your fertilizer manufacturer for EMJEO, long a dependable source of this key plant food.

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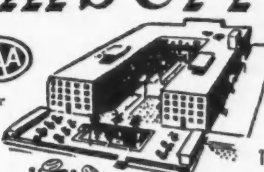
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CITRUS INSECT CONTROL FOR SEPTEMBER, 1955

(Continued from page 3)

spray for scale control and wettable sulfur can be combined with all materials except oil for rust mite control. However, if the grove was sprayed with sulfur a week or two before the miticide application, it is not necessary to use sulfur with ovex or aramite.

Rust Mite Control: Rust mite control is likely to be necessary throughout the month. On grapefruit, and mid-season and late varieties of oranges, lime-sulfur at 3/4 gallon plus 5 to 8 pounds of wettable sulfur per 100 gallons can be used. On tangerines, Temples and early varieties of oranges, use wettable sulfur at 8 to 10 pounds per 100 gallons. A sulfur can be used on light infestations, but it is usually not as effective as a spray. In groves where there is sunburn on the fruit, lime-sulfur is more likely to cause further burn than wettable sulfur, but any type of sulfur may cause some burn when applied during hot, dry weather.

For more detailed information refer to the 1955 "Better Fruit Program" or consult the Citrus Experiment Station at Lake Alfred or Fort Pierce.

EXPERIMENT STATION RECEIVES GRANT FOR ANTIBIOTICS STUDIES

A grant which provides funds for studies to show effects of antibiotics on livestock has been made by Lederle Laboratories Division, American Cyanamid Company, to the University of Florida, Dr. T. J. Cunha, Head of the Department of Animal Husbandry and Nutrition, announced recently.

The \$3,000 grant will carry two

Classified Ads

SUPERIOR CITRUS TREES — Now accepting orders for Spring 1956 delivery. Sorry — we are sold out of Valencia and Hamlin, but have good supplies of other varieties. Call 2-7541 for quotations. Leaflet "Tips for Growers" mailed on request.

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PERSIAN LIME TREES — Ready for delivery. Other popular varieties all on rough lemon root, for delivery now or January, 1956.
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USDA PURCHASES GRAPEFRUIT SECTIONS FOR SCHOOL LUNCHES

Purchases of canned grapefruit sections for the National School Lunch Program were announced by the U. S. Department of Agriculture.

The purchase of canned grapefruit sections covered 89,875 cases (24 No. 303 cans per case) at prices ranging from \$2.49 to \$2.57 per case. All prices are f.o.b. shipping point. Cash discounts and bracing charges were considered in making the acceptances.

projects through April 30, 1956, Dr. Cunha said, adding that Lederle has made several similar grants during the last seven years at Florida.

"The two studies presently in progress are directed by Dr. H. D. Wallace and Dr. J. F. Hentges, Jr.," he said. "Dr. Wallace is investigating the effect of aureomycin on growing pigs and sows; Dr. Hentges is studying the effect of the same antibiotic on the rations of fattening steers."

Purchases were made with School Lunch funds under the provisions of Section 6 of the National School Lunch Act.

The canned grapefruit sections, all from Florida processors, will be delivered during the period August 15 through September 10, this year, to schools participating in the National School Lunch Program.

On July 22 the Department announced the purchase of 131,200 cases of this product. Purchases under specifications mailed to grapefruit canners on July 8, 1955, have been completed, the Department said.

Hurricane-conscious Floridians who like to keep track of the location of storms — where they are and where they seem to be heading — can get an excellent chart for this purpose from Florida Citrus Mutual.

The chart is free. Requests should be addressed to:

Hurricane Chart, Florida Citrus Mutual, P. O. Box 499, Lakeland, Fla.

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Extensive usage has proved Aramite gives effective immediate and residual control of Purple Mite (Citrus Red Mite) and Six-Spotted Mite on citrus. Recommended by the Florida Agricultural Experiment Station. Aramite is effective

against mite adults, nymphs and eggs—immediately stops feeding of adults and young and kills within 72 hours. Field usage has definitely established Aramite-Sulfur compatibility—whether Aramite is tank-mixed with wettable sulfur or field-sprayed before or after sulfur dusting or spraying. Safe on citrus, leaves no harmful residue, is non-hazardous to handlers and does not kill off beneficial insects.

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But since the chances are that trees will never reach this advanced stage of culture it behooves every grower to judge from the physical condition of his trees and the nature of the crops they produce as to the effectiveness of the fertilizer which provides the trees with their plant food.

It is the sincere belief of this company that we furnish in our Lyons fertilizers the finest plant foods that it is possible for the best materials to produce.

This belief, apparently is not confined to members of our organization as is evidenced by the large number of growers who continue to use Lyons Fertilizers year after year . . . and whose crops bear eloquent witness to the effectiveness of our fertilizers.

We are pleased, also, to report that the number of customers is increasing with each passing year . . . and we firmly believe that if you will use Lyons Fertilizers you will be numbered among our long list of permanent customers.

Our Field Service Men will be only too glad to co-operate with you in dealing with any special problems which may be peculiar to your groves . . . and completely without obligation.

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